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# 12 Manholes, Inlets, and Catch Basins

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# ***CHAPTER TWELVE: MANHOLES, INLETS, AND CATCH BASINS***

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There are numerous types of manholes, inlets and catch basins. The Standard Drawings contain diagrams for each type of structure. Standard Drawings **E 720-CBCA-01**, **E 720-INST-01**, **E 720-INCA-01 & 02**, **E 720-MHCA-01 & 02**, and **E 720-MHST-01** may be found in Appendix C.

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## **STRUCTURE**

The letter prefix listed in the Standard Drawings represents the structure type and the number suffix is for the casting type. Thus, an E-7 inlet would be type E box using a type 7 casting.

## **METHODS OF CONSTRUCTION**

Several types of construction methods are designated for manholes, inlets or catch basins. Some units may be constructed from brick, block, concrete class A, or precast, when permitted. The materials that are used for each type of structure are noted on the applicable Standard Drawing.

When constructing manholes, inlets, or catch basins in the field, the excavation for the floor slab is required be on firm, stable soil. If rock is encountered, the rock is required to be removed 6 inches below the bottom elevation and backfilled with B borrow.

When precast units are used, bases are required to be set on a minimum of 4 inches of compacted B borrow.

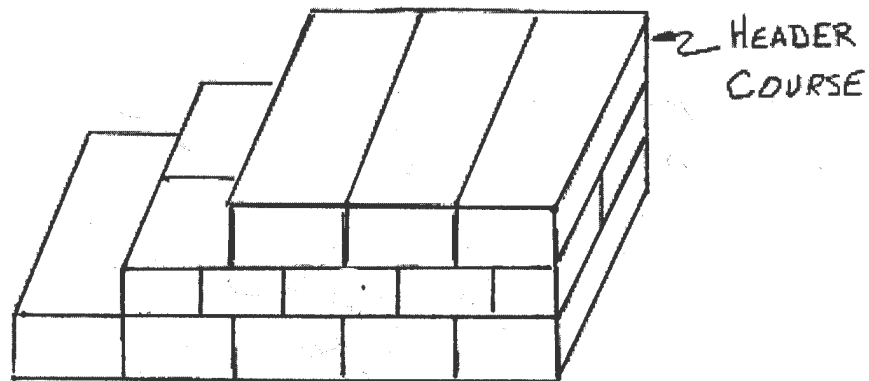
## **MATERIAL REQUIREMENTS**

### ***CONCRETE***

Concrete construction is required to be in accordance with Section **702** and reinforcing steel in accordance of Section **910.01**.

### ***BRICK OR BLOCK***

Brick or other masonry units are required to be laid with joints not exceeding 3/8 inches. If brick is used, at least every 7<sup>th</sup> course is required to be laid as a header course (Figure 12-1).



**Figure 12-1. Brick Manhole, Inlet, or Catch Basin**

In the header course, the bricks are turned so that the mortar joint does not run continuously from the top to the bottom of the structure.

Brick or block structures are required to have a 1/2 inch mortar plaster coat on the inside and outside of the structure, as designated.

## **STRUCTURES IN PAVEMENT AREA**

When manhole castings are surrounded by concrete pavement, the casting is required to be the same thickness as the concrete pavement. Where castings are adjacent to or surrounded by concrete pavement, they are separated from the concrete pavement by using a 3/8 inch minimum thickness preformed joint filler.

## **HOODS FOR CATCH BASINS**

Cast iron hoods for catch basins are to be installed in the walls of the structure as shown on the plans or in the Standards. These are to be placed so that a 6 inch seal is formed. Joints between castings and the structure are required to be made gas tight by use of cement mortar.

## **MORTAR MIXTURE**

Mortar for laying brick or block is required to be 1 part masonry cement and 2 parts mortar sand. The mortar for plastering a brick or block structure may be the same or may be made using 1 part Portland cement, 1 part hydrated lime and 2 parts mortar sand. The lime should not exceed 10% of the cement.

## PRECAST STRUCTURE OPENINGS

When using precast structure components, the opening for the pipe may be either preformed or field cut. The gap between the structure and the pipe is required to be filled with Class A concrete. If openings are cast or cut in the wrong locations, they are required to be filled satisfactorily and the new holes placed in the required locations. The cost to cut or form holes and seal the pipe with a concrete collar (Figure 12-2) is included in the structure cost (the pipe in Figure 12-2 should have been cut off flush with the manhole).



**Figure 12-2. Base Section of 48 inch Manhole**

## STRUCTURE JOINTS

Horizontal joints may be used in the construction of precast structures. The Contractor or Supplier is required to submit drawings showing the location of the joints, type of joints, and types of sealers to be used for approval prior to the construction of these units. No joint may be closer than 3 inches above standing water for those catchbasins requiring hoods.

## **ADJUSTMENTS**

There will be no cost adjustment for precast structures that are required to be located in a different location or that require height adjustment to meet the necessary grade. These costs are included in the structure costs.

### **GRADE ADJUSTMENT TO EXISTING STRUCTURES**

#### ***ADJUSTING EXISTING STRUCTURES***

When grade adjustments for existing structures is required, the casting frame, covers, or gratings are required to be removed and the walls of the structure reconstructed as required to meet the necessary elevation. If an existing casting is unfit for re-use, the casting is replaced with the type specified. If an existing casting is in good condition and is of the type required, the elevation may be adjusted by the use of risers or adjusting rings.

#### ***REPLACING CASTINGS***

Castings are replaced with the type specified and adjusted to the required grade. This grade adjustment includes up to 12 inches of masonry reconstruction in average height, cleaning of the existing structure, and keeping the structure clean until the final acceptance of the work.

#### ***RECONSTRUCTED STRUCTURES***

If masonry reconstruction exceeds 12 inches, that portion above 12 inches is required to be paid as a reconstructed structure of the type of inlet, manhole, or catch basin specified.

#### ***CASTINGS IN PAVEMENT AREA***

When castings adjusted to grade are in concrete pavement or adjacent to concrete pavement, they are separated from the concrete by at least a 3/8 inch preformed joint filler. The cost of the joint filler is to be included in the cost of other items.

#### ***ADJUSTMENT ON RESURFACE CONTRACTS***

On resurface contracts, unless otherwise permitted, castings are required to be adjusted prior to placing the surface course.

#### **PAYMENT OF MANHOLE, INLETS, AND CATCH BASINS**

##### ***BASIS OF USE***

Payment is made for the placed quantity of manholes, inlets, or catch basins by the specified type each. Castings are paid as each, for the type specified. Castings furnished and adjusted to grade (not exceeding 12 inches or masonry work) are paid as each for the type specified. The portion of masonry work necessary above a 12 inch average height is paid for by the linear foot and the type of structure specified.

##### ***MISCELLANEOUS REQUIREMENTS***

Excavation, backfill, reinforcing steel, replacing pavement, and other miscellaneous items necessary to complete the work are not paid, but are included in the cost of the other items.